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CURRENT LITERATURE

BOOK REVIEWS

British vegetation

In two respects, at least, the appearance of *Types of British vegetation* marks an epoch in the development of plant geography.[1] In the first place, the publication of the volume at this time is due to the organization of an International Phytogeographic Excursion in the British Isles during the summer of 1911. The volume was prepared in anticipation of this excursion, and advance copies were presented to the members of the party. The chief result of this excursion has been to internationalize for all time the subject of plant geography, and to divest it of the provincialism which has hitherto too greatly characterized it. Besides marking the initiation of internationalism in phytogeography, this volume marks another great advance, namely, the study of vegetation by an organization rather than by an individual. While edited by TANSLEY, the volume was gotten together by the "Central Committee for the survey and study of British vegetation," more popularly known as the "British vegetation committee." It is not so long ago that the study of vegetation played an insignificant part in British botany. Through the work of their vegetation committee, the British not only have caught up with their American and continental brethren, but, in organization at least, they have forged ahead.

The introduction deals with the units of vegetation, following the general lines marked out previously by MOSS.[2] While all plant geographers seem to believe in the reality of the terms formation and association, and to believe that the formation should be used as the larger unit, including various smaller units or associations, it is evident from this book, as from the discussions of the 1911 excursion, that the British plant geographers differ radically from all others in the practical application of these terms. For example, calcareous soils are regarded as having a single formation, which includes such diverse things as limestone-pavement associations with almost bare rock surface, limestone grassland, limestone scrub, chalk heath, yew woods, ash woods, and beech woods. Similarly the sand-dune formation is composed of strand associations, morrain-grass and couch-grass associations, dune grassland, dune scrub with willows, and dune marshes. The reviewer has shown that on the sand dunes of Lake Michigan there is to be found nearly every kind of plant formation characteristic of the region, from the xerophytic vegetation of the moving dunes or the swamp vegetation of the dune depressions to a mesophytic climax forest of beech and maple. By the British concept all of these are to be considered as composing a single formation! It must be admitted that the British concept of formation is the most workable yet proposed, for it represents in essence the aggregate of plant associations which compose a successional series on a given habitat. It must be admitted also that those who oppose the British concept are not agreed among themselves, when it comes to actual field discriminations between associations and formations. However, the British concept proposed by Moss and adopted by the committee, represents a most radical departure from all past formational concepts, and seems to be out of harmony with the proposals internationally agreed upon in Brussels in 1910.

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[1] TANSLEY, A. G., with various collaborators, Types of British vegetation. pp. xx+416. *pls. 36. figs. 21.* Cambridge: University Press. 1911.

[2] See BOT. GAZ. **52**:321. 1911.

Whatever may be said concerning concepts and modes of classification, nothing but praise can be rendered for the detailed presentation of British vegetation. The editor presents the chapter on British climate, as well as a part of that on the soil; W. G. Smith gives the part on Scottish soils, and G. A. J. Cole that on Irish soils. Following a description of the general distribution of British vegetation by the editor is an account of the plant formation of clays and loams, also by the editor. The chief association here is that dominated by *Quercus pedunculata*, with an undergrowth dominated by the hazel. This formation includes also retrogressive associations of scrub (dominated largely by Rosaceae) and grassland. The editor contributes also the chapter on the formation of sandy soil. The chief association is that of oakwood, in which *Q. sessiliflora*, as well as *Q. pedunculata*, is a prominent member. The chapter on the heath formation is presented as a whole by the editor, the part on Scottish heaths being contributed by W. G. Smith. As was well shown at various points in the 1911 excursion, the heath often has originated retrogressively through the degeneration of woodland. The first step in such retrogression appears to be the invasion of oakwood by birch and heather; after a time the heath may become dominant. The heath in time may be invaded by pine or birch, illustrating progressive succession.

Most of the chapter on formation of the older siliceous soils is contributed by Moss. The chief association is an oakwood dominated by *Q. sessiliflora*. Retrogression from forest through scrub to grassland is well illustrated in this formation. The splendid oak woods of Killarney, with their Mediterranean components, notably *Arbutus Unedo*, are classed here; the Killarney forest proved to be one of the most fascinating areas visited by the 1911 excursionists. In the preparation of the extensive and interesting chapter on the formation of calcareous soils, the editor was aided by Moss and also by W. M. Rankin. Three subformations are here recognized, that of the older limestones, that of the chalk, and that of the marls and calcareous sandstones. The first is presented by Moss, who also conducted the excursion to the Derbyshire dales, where it is well illustrated. The chief association is dominated by the ash, *Fraxinus excelsior*, and retrogressive stages to scrub and later to grassland are frequently observed. A remarkable association is that of the limestone pavements, such as the 1911 party visited in western Ireland; these areas have much bare rock surface, and a most interesting vegetation, largely mesophytic, is all but hidden in deep crevices. The chalk hills or downs, while resembling the older limestones, are characterized more by beech woods than by ash woods, though the latter are sometimes found. Another interesting type of the chalk is the yew woodland.

The chapter on aquatic vegetation is by the editor, except for the part on the plankton, which is contributed by G. S. WEST, and the part on quickly flowing streams, which is contributed by MOSS. Short chapters follow on the marsh formation and on the vegetation of peat and peaty soils, both by the editor. Miss PALLIS, the efficient guide of the 1911 excursion in the Norfolk Broads, contributes a chapter on the aquatic and fen formations of that region. This chapter presents a district as a unit, the consideration of the physiographic development of the area being followed by a treatment of the aquatic formation and the fen formation with its various associations, and by a discussion of the genetic relationships of the associations involved.

Two chapters are devoted to the moor formation, the lowland moors being presented by the editor, assisted by RANKIN, and the upland moors by F. J. LEWIS, C. E. MOSS, and W. G. SMITH. RANKIN, who conducted the 1911 party to some of the Lancashire moors, considers the latter under the two heads of estuarine and lacustrine moors, the former being much the more extensive. While the heather, *Calluna vulgaris*, generally dominates the successional series, here it seems to culminate in a birchwood, but there are many examples of retrogression to heather moorland with birch stumps buried *in situ*. RANKIN considers also the valley moors of the New Forest, which were visited from Portsmouth at the close of the excursion. Upland moors were seen frequently during the course of the excursion, the foreign guests being repeatedly surprised at their vast extent, especially in habitats which in most parts of the world would be forested. That these were once forested, at least in part, was made evident again and again by the discovery of forest layers buried in the peat. Over vast areas the dominant plant of the upland moors is a cotton grass, *Eriophorum vaginatum*. In some places, especially in Scotland, there are extensive grass moors. Denudation and retrogression are frequently conspicuous.

The chapter on arctic-alpine vegetation is presented by W. G. SMITH, who was the chief guide of the party in Scotland. The discussion is devoted chiefly to Ben Lawers, which was visited by the excursionists. The delimitation of formations here is more in harmony with that employed by most writers, the author distinguishing three formations near the summit: the arctic-alpine grassland formation, the formation of mountain top detritus, and the formation of arctic-alpine chomophytes (i.e., plants of rock ledges and fissures). The final chapter, prepared chiefly by the editor, considers the vegetation of the sea coast, the chief formations recognized being the salt marsh and the sand dune. The composition of the various associations and the trend of succession are like those of the Continent and are familiar through the work of Warming, Massart, and other writers. Perhaps the most unique feature of the British coast is afforded by the shingle beach communities, which are most ably treated by Oliver, who conducted the 1911 party to his seaside laboratory at Blakeney, where these communities are well developed. The most striking feature here is the presence of a shingle or gravel dune, which invades the marshland and presents conditions resembling in many ways the more familiar phenomena of sand dunes.

The photographic illustrations in this volume are notably well selected, and most admirably reproduced, and are supplemented by a few instructive diagrams. The British vegetation committee may well be proud of their record for 1911. It is to be hoped and expected that such books as the one here reviewed, and such phytogeographic excursions as the one here mentioned, will hereafter be frequently recurring features of phytogeographic progress.—H. C. Cowles.

The soil solution

Those plant physiologists who are interested in the subterranean surroundings of plants and in the relations which obtain between soil conditions and plant activity will welcome Cameron's little book entitled *The soil solution.*[3] The treatment is exceedingly clear and concise, logically arranged, and very readable. Furthermore, it is unquestionably the best and most scientific treatise on this difficult yet most important subject which we have seen. The author originally approached the soil problems from the standpoint of the chemist, developing their biological and agricultural aspect according to the demands of researches under his direction, and perhaps this fact has left a mark upon some of his discussions which may seem novel to the reader coming to this field from a specifically botanical training. But the novel features of the author's treatment may be regarded as quite in line with the recent trend of physiology toward a quite uncolored physical treatment.

Another group of workers whose attitude toward plant happenings is often not that of the physiologist, and whose activities have been mainly directed toward the empirical acquisition of more or less superficial principles and relations, will read Cameron's contribution with much interest, perhaps even with excitement. We refer here to students of practical agriculture, who will find here that some of the most widely accepted hypotheses of this field are clearly discredited. This will not be at all surprising, however, to him who has followed the recent literature, for the previous publications of the author and his colleagues have given, from time to time, the main features of the researches upon which his present attitude toward soil science has been built up. During

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[3] Cameron, Frank K., The soil solution, the nutrient medium for plant growth. pp. v+136. *figs. 3.* Easton (Pa.): The Chemical Publishing Co. 1911.